REMARKS

Claims 1-3 and 5 remain pending in the application. Claim 4 has been cancelled. Claims 6-9 are newly added. Applicant requests reconsideration in light of the remarks presented below.

The Office Action objected to the drawings as failing to comply with 37 CFR 1.84(p)(4). The specification has been amended herein to correct a typographical error in the specification and clarify that element 34 is the power supply part and that element 43 is the electrode part.

The Office Action objected to the drawings as failing to comply with 37 CFR 1.84(p)(5). Figure 2 has been amended herein to remove the reference numbers 45, 51, and 61. The specification has been amended herein to call out the reference numbers for the Molybdenum coils 37, 47.

The Office Action objected to the specification as not being descriptive. The title has been amended herein to be more descriptive.

Applicant's invention provides an improvement in the field of halide lamps. Applicant has achieved this improved performance after extensive study and testing.

> "Thus when differences that may appear technologically minor nonetheless have a practical impact, particularly in a crowded field, the decision-maker must consider the obviousness of the new structure in this light."
>
> *Continental Can Co. USA Inc. v. Monsanto Co.,* 20 U.S.P.Q. 2d. 1746, 1752 (Fed. Cir. 1991).

The specification explains some of the studies and tests performed by the Applicant to arrive at the improved halide lamp (Application, Figures 4 and 5, Page 11, Line 8 – Page 14, Line 19). The Applicant's lamp features a polycrystalline alumina ceramic arc tube having a grain diameter between a half and five micrometers and 200 parts per million or less of

magnesium oxide. The arc tube is relatively thin with the length of the arc tube at least twice the diameter. The arc tube may be loaded with an electrical power load of twenty to fifty watts per centimeter squared.

Claims 1-5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Keijser et al.* (U.S. Pat. No. 6,300,729) in view of *Kurashina et al.* (U.S. Pub. No. 2002/0155944). Applicant respectfully traverses.

Keijser discloses a halide lamp with an increased lamp voltage (*Keijser*, Title). *Keijser* achieves this objective by filling the lamp with not only sodium and mercury halides but by introducing Thalium, Dysperium, and Cerium halides (*Keijser*, Column 3, Lines 8-10). *Keijser* proposes four possible embodiments of his invention with varying ratios of halides (*Keijser*, Column 3, Line 9-10, 39-40, 64-65, Column 4, Line 6).

Kurashina discloses a ceramic polycrystal to be used as a constitutive part of an arc tube for a high pressure discharge lamp (*Kurashina,* Paragraph 2). *Kurashina* proposes using a ceramic polycrystal with an average grain size in the range of five to 50 micrometers (*Kurashina*, Paragraph 12). *Kurashina* teaches that the ceramic polycrystal should be formed with a mixture of 250 ppm of magnesium oxide powders. *Kurashina* also asserts that such a polycrystal lacks a cubic structure and that temperature variations from 1200 degrees Celsius to room temperature will not result in cracks (*Kurashina*, Paragraph 13).

Claim 1 recites "a main tube part made of polycrystalline alumina ceramic having magnesium oxide of 200 ppm or below". *Kurashina* teaches the use of magnesium oxide at 250 ppm (*Kurashina*, Paragraph 28). The Office Action asserts that based on this teaching it would have been obvious for someone of ordinary skill in the art to vary *Kurashina's* 250 ppm to 200

ppm or below and combine it with the teachings of *Keijser* (Office Action, Page 5, Lines 4-11). Applicant traverses on multiple grounds.

First, the Office Action relies on legal precedent to assert that it would have been obvious for someone of ordinary skill in the art to adjust *Kurashina's* teaching of 250 ppm to 200 ppm or below (Office Action, Page 5, Lines 8-11). The Office Action incorrectly asserts that is has been held that discovering an optimum value of a result effective variable involves only a routine skill in the art (Office Action, Page 5, Lines 10-11). The Office Action also improperly fails to cite the legal authority for this assertion. Applicant submits that the Office Action is misinterpreting existing case law.

According to the MPEP, controlling legal authority holds that a particular parameter must first be recognized as a result-effective variable before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation.

> A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) (The claimed wastewater treatment device had a tank volume to contractor area of 0.12 gal./sq. ft. The prior art did not recognize that treatment capacity is a function of the tank volume to contractor ratio, and therefore the parameter optimized was not recognized in the art to be a result- effective variable.).
>
> MPEP § 2144.05 (II) (B)

Kurashina does not recognize that a magnesium oxide concentration affects the luminous flux or the lifecycle of the lamp. Thus experimenting with the concentration of magnesium oxide would not be routine experimentation. Moreover, there is no motivation or suggestion in *Kurashina* to use anything other than the called for concentration of magnesium oxide.

Second, the use of 200 ppm or below of magnesium oxide is not obvious to one of ordinary skill in the art. The selection of 200 ppm or below of magnesium oxide was a result of extensive study and experimentation (Application, Figure 3, Page 14 Line 21 – Page 18 Line 18). First, Applicant recognized that abnormal grain growth could be avoided at high sintering temperatures by mixing magnesium oxide with alumina (Application, Page 17, Lines 3-10). Next, Applicant experimented with various types of furnaces before determining that a Tungsten furnace would provide an adequate crystal grain (Application, Page 18, Lines 10-17). Applicant then tested the lifecycle of the lamps and discovered that adding magnesium causes the inner wall of the arc tube to darken (Application, Page 19, Lines 11-19). As a result of this finding the Applicant's performed more tests to determine the luminous flux relationship to the magnesium oxide concentration (Application, Figure 3, Page 19, Line 20-Page 21, Line 11).

In contrast, *Kurashina* is silent on the effect of magnesium oxide concentration on the luminous flux. *Kurashina* fails to suggest that by decreasing the magnesium oxide concentration the luminous flux may be increased as shown in Figure 3 (Application, Figure 3). Moreover, without a substantive test program it would not be obvious to someone of ordinary skill in the art how the magnesium oxide concentration would effect the luminous flux intensity after 12,000 hours of use (Application, Page 20, Lines 13-25).

Third, the Office Action improperly combines *Keijser* with *Kurashina* without providing a motivation to combine these reference (Office Action, Page 5, Lines 4-11).

> VSI is unable, however, to point to any specific teaching or suggestion for making this combination. VSI instead relies on what it presumes is the level of knowledge of one of ordinary skill in the art at the time of the invention to supply the missing suggestion to combine. In the first place, the level of skill in the art is a prism or lens through which a judge or jury views the prior art and the claimed invention. This reference point prevents these deciders from using their own insight or, worse yet,

> hindsight, to gauge obviousness. Rarely, however, will the skill in the art component operate to supply missing knowledge or prior art to reach an obviousness judgment. See *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 U.S.P.Q. 303, 312-13 (Fed. Cir. 1983) ("To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher."). Skill in the art does not act as a bridge over gaps in substantive presentation of an obviousness case, but instead supplies the primary guarantee of objectivity in the process. *See Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718, 21 U.S.P.Q.2d 1053, 1057 (Fed. Cir. 1991).

Combining these references is only obvious in hindsight because Applicant's invention is a result of numerous engineering design tradeoffs. For example, the size of the arc tube and the concentration of magnesium oxide both interact to have a mutual effect on the change in luminous flux of the lamp over time. These types of tradeoffs often require considerable analysis or testing. For example, after Applicant's realized that it may be beneficial to decrease the magnesium oxide concentration, Applicant had to experiment with various ovens and sintering techniques to be able to generate an acceptable arc tube (Application, Page 18, Lines 10-17). Unusual results were also found during testing. For example, the grain diameter affects the reactivity with magnesium oxide and may cause bonding with earth iodide generating magnesium oxide (Application, Page 19, Lines 11-15). Thus changing the magnesium concentration according to a secondary reference is not obvious because it affects other design variables in unpredictable or unexpected ways. Extensive lifecycle testing is thus required to characterize the effects of a change in magnesium oxide concentration.

Claims 2-3 and 5 depend from claim 1 and are patentable for the same reasons as claim 1. Accordingly, applicant respectfully requests that this rejection be withdrawn.

Claims 6-9 are newly added and recite an embodiment of the invention previously disclosed but not claimed. Claim 6-9 recite a main tube part made of polycrystalline alumina ceramic having magnesium oxide in a range of 1 ppm to 200 ppm wherein a uniform grain dimension is provided, and containing a discharge space in which the electrodes of the electrode structures are located to oppose each other. This newly claimed feature emphasizes the desirable range for producing lamp with a luminous flux factor of 70% or greater at 12,000 hours (Application, Page 20, Lines 13-15). This range also restrains abnormal grain growth (Application, Page 20, Lines 22-24). As explained above, *Keijser* or *Kurashina* fail to disclose or suggest using a polycrystalline alumina structure having a magnesium oxide in the recited range.

Applicant believes the Application is now in condition for allowance and respectfully requests early notification of the same.

If the Examiner believes a telephone interview will help further the prosecution of this case, the undersigned attorney can be reached at the listed phone number.

Very truly yours,

SNELL & WILMER L.L.P.

Joseph W. Price
Registration No. 25,124
600 Anton Boulevard, Suite 1400
Costa Mesa, California 92626-7689
Telephone: (714) 427-7420
Facsimile: (714) 427-7799